

# **RD400SL-2**

## **User Guide**

Revision 0 - 05.97

# RD400SL-2 User Guide

## **About this User Guide**

This User Guide is divided into sections as follows:

### **RD400SL-2 Receiver**

This section details where to find and how to use the various operating controls and features, etc., relevant to the RD400SL-2 receiver.

As there are several RD400SL-2 variants, some of the features described in this section may not be available. Refer to the product label for features available.

### **Receiver Use**

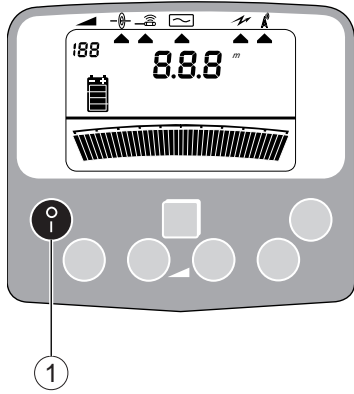
This section describes how to use the RD400SL-2 to locate, trace, pinpoint and measure depth.

### **RD400LCTx Transmitter**

This section details where to find and how to use the various operating controls and features, etc., of the RD400LCTx Transmitter.

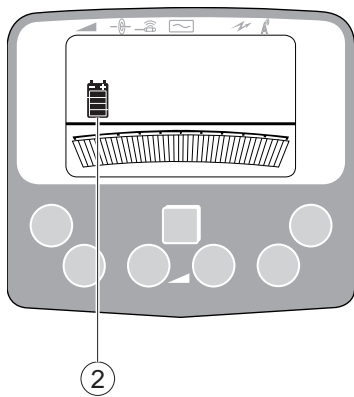
### **Transmitter Use**

This section describes how to apply a signal to a target line using the RD400LCTx Transmitter.



### On/Off (1)

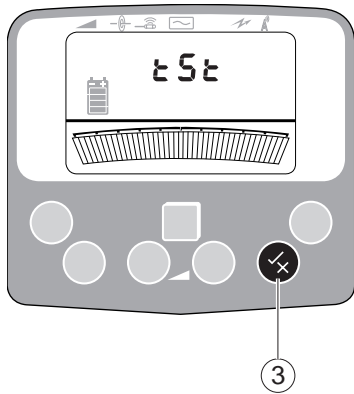
One press for On, further press for Off. If after 5 minutes no control key has been pressed, there is an audible warning followed by auto switch Off.



### Batteries (2)

Display provides 4 segment continuous indication of battery status. When battery replacement is necessary, display shows flashing battery symbol and 'Lo bat' followed by Receiver switching off.

Unscrew battery compartment cover and replace 12 x LR6 (AA) Alkaline batteries. Observing correct battery polarity as indicated on battery holder.



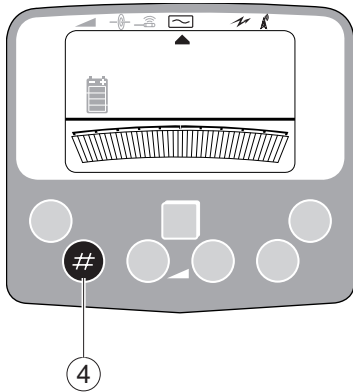
### Self Test (3)

Press to initiate Self Test - 'tSt' is displayed momentarily followed by 'PAS' (Pass) or 'FAL' (Fail). If the Receiver fails the Self Test consult your Dealer/Supplier.

*Note: This does not confirm the calibration of the Receiver.*

# RD400SL-2 User Guide


## RD400SL-2 Receiver



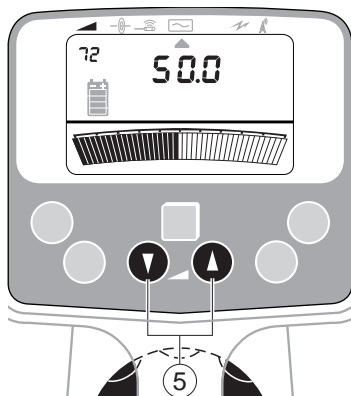
### Mode (4)

Moves the mode pointer through choice of modes available from those indicated along top of display. Selects Power or Radio (passive modes) and Transmitter frequency (active mode).

Frequencies/Modes available:

 8192 Hz (8 kHz)  
or 32768 Hz (33 kHz)

 Power  
 Radio



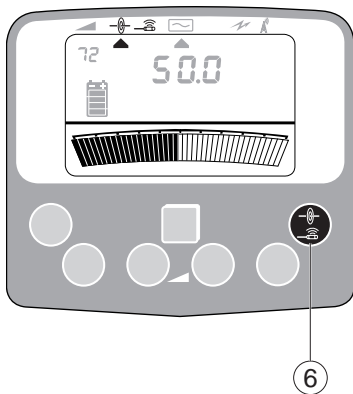
### Gain Down/Up (5)

Press either key or operate Touch Gain Control, if fitted to increase or decrease Receiver gain.

If bargraph indicates full scale press Down Arrow key to automatically reduce indication level.

A numeric representation of meter deflection percentage is displayed above bargraph.

Actual Receiver Gain level (0 to 100) is displayed below Gain symbol.



### Line/Sonde (6)

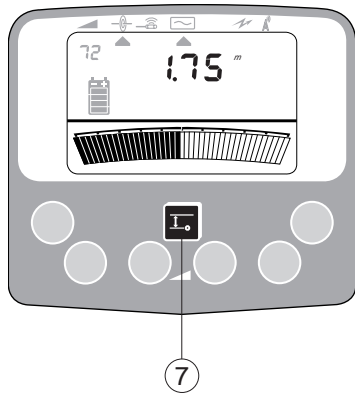
Press to select Line or Sonde mode. The pointer indicates selection.

 **Warning**

**Failure to select appropriate Line/Sonde mode will result in incorrect depth estimation.**

# RD400SL-2 User Guide

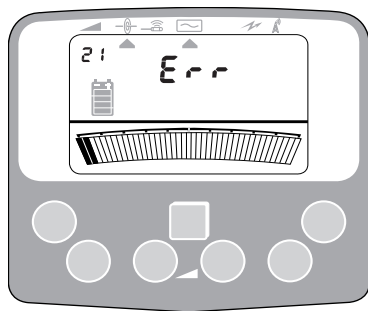
## RD400SL-2 Receiver



### Depth (7)

Press to display depth from Receiver to target line/sonde when directly over line/sonde.

Depth measurement is not available in Power or Radio modes.



### Error Codes

Error Codes are displayed where gain dB level normally appears accompanied by an 'Err' message.

Error #9 - Indicates that signal is too small or too large to measure Depth. Check Transmitter settings.

Error #11 - Indicates a strong overhead signal.

Error #21 - Indicates that depth to target line/Sonde is beyond Depth measurement range.

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## Receiver Use

### Locate

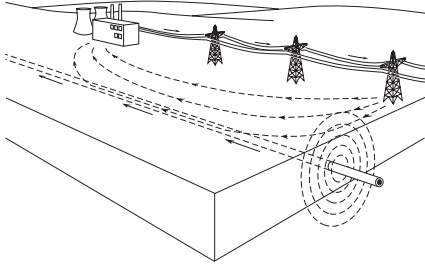
Switch Receiver On. Options and facilities available are indicated during display test.

Check Receiver battery indicator shows at least one bar.

If required, initiate a Self Test.

### Power Mode

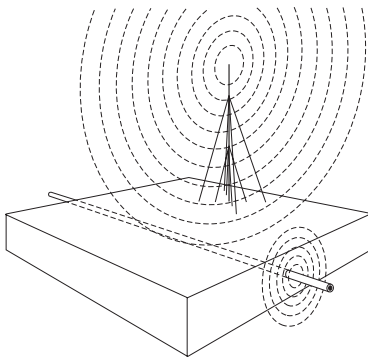
Some cables radiate power energy signals.



### Radio Mode

Some cables or other buried metal utility lines do not radiate power energy signals but can be detected by locating re-radiated radio signals.

No transmitter is needed to locate in the Power and Radio modes.



### Active Mode

Apply the transmitter signal and switch on. Select desired frequency. Refer to 'Tx Use' section.

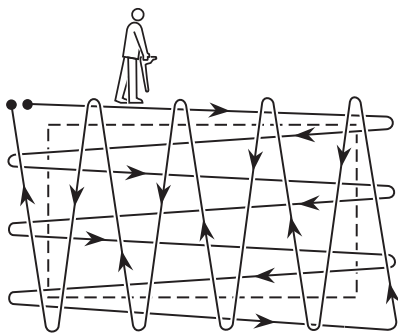
Select the required transmitter frequency on the receiver.

Select Peak and Line modes.

Adjust gain so bargraph is approximately mid scale.

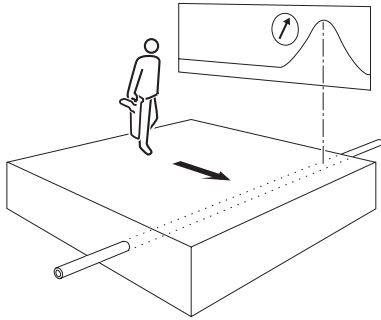
Holding Receiver blade vertical at all times, sweep area to be excavated with a steady and deliberate motion.

If necessary adjust gain to keep meter on scale.

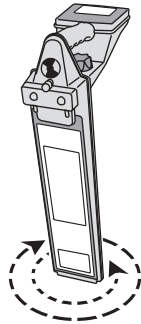


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## Receiver Use



When a signal is detected continue along search route until signal strength reduces, returning to position where signal is strongest.

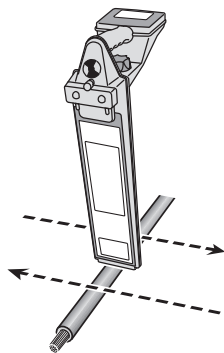


### Pinpoint

Rotate Receiver through 90° until minimum signal is detected.

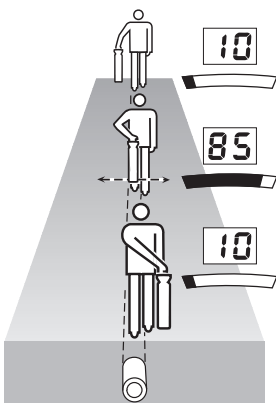
Receiver blade is now in line with target line.

Rotate Receiver back through 90° so that blade is again across target line.



Move Receiver side to side and observe maximum response over centre of signal.

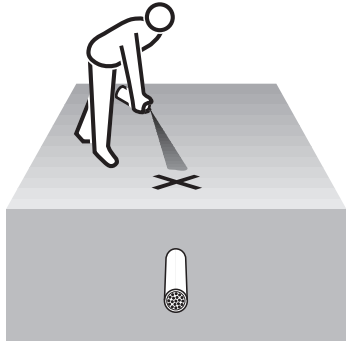
Receiver blade is now over target line and across it.



Moving Receiver steadily from side to side, follow line of maximum response, keeping blade vertical and across the target line.

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## Receiver Use



Mark target line position with chalk or paint.  
Continue sweeping the area, following grid pattern.

### Null

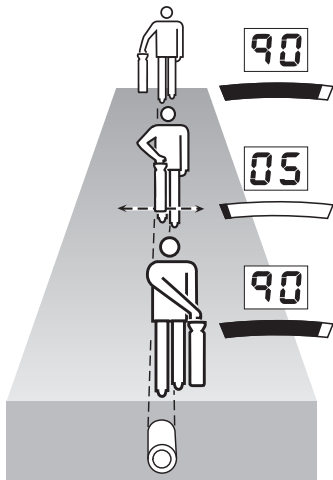
Select Null mode.

Walk along path of target line. Minimum response with an increased response each side indicates position of target line.

When the Receiver blade is across the target line, on some receivers, the Left/Right arrows on display will point in the direction of the target line.

Stop every 10 - 20 paces and check position.  
Periodically switch back to Peak to confirm position.

*Note: Although the Peak position of a line is more difficult to identify, it is usually more accurate than the Null position.*



### Depth Reading to a Line

Depth readings can only be accurately performed when using the active transmitter mode.

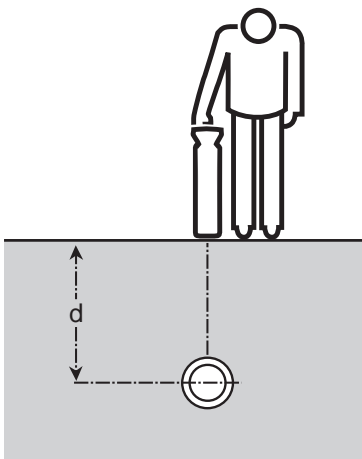
Pinpoint target line as previously described. Hold Receiver vertically with blade resting on the ground.

Ensure Line mode is selected.

Momentarily press the Depth key. Depth reading is displayed for a few seconds.

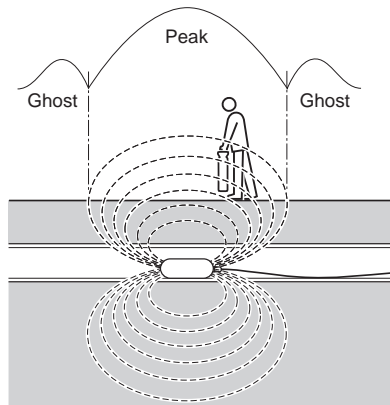


**Warning**  
**Certain conditions can cause depth errors.**



### Depth in Power Mode

As current on power cables may fluctuate Depth readings in Power mode are NOT as reliable as active transmitter Depth measurements.



### Pinpointing a Sonde

Select Sonde and Peak modes, set Receiver to Sonde frequency.

Holding Receiver blade vertically and IN LINE with Sonde, move from side to side to obtain a Peak response.

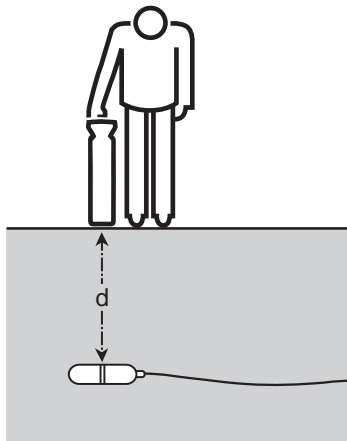
*Note: Ghost peaks will be found either side of main Peak response.*

Move Receiver backwards and forwards to obtain a second Peak response.

Rotate Receiver clockwise and anticlockwise to obtain a third Peak response.

The Receiver is now directly over and in line with Sonde.

Pinpoint and mark at regular intervals.



### Depth Reading to a Sonde

Pinpoint the Sonde.

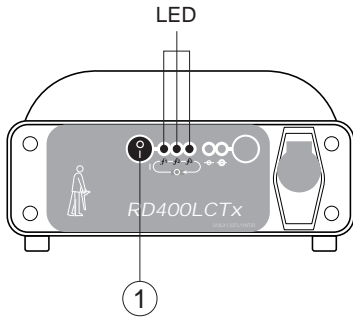
Hold Receiver vertically with blade resting on the ground.

Ensure Sonde mode is selected.

Press the Depth key. Depth reading is displayed for a few seconds.

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## RD400LCTx Transmitter



### On/Off (1)

First press turns Transmitter On and selects first frequency (not available in Induction mode).

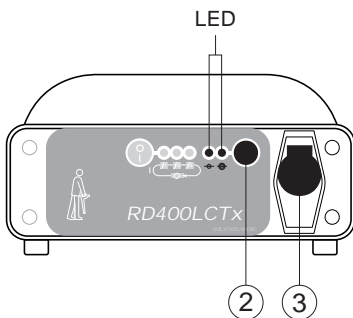
Second press selects second frequency.

Third press selects third frequency.

Fourth press turns Transmitter Off.

LEDs indicate which frequency has been selected.

Arrows on the instruction label indicate the required transmitter alignment for signal induction.



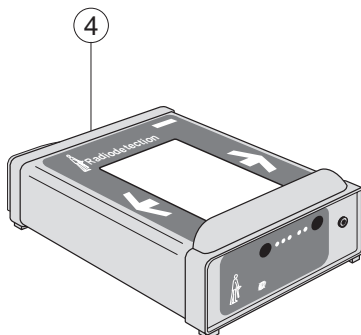
### Power Select (2)

Selects either High or Low power level.

LEDs indicate which power level has been selected.

### Connection Socket (3)

Accepts Connection Cable or optional accessories such as Signal Clamp, Live Cable Connector or Live Plug Connector, which, when connected, disables the Induction mode.



### Batteries Access Panel (4)

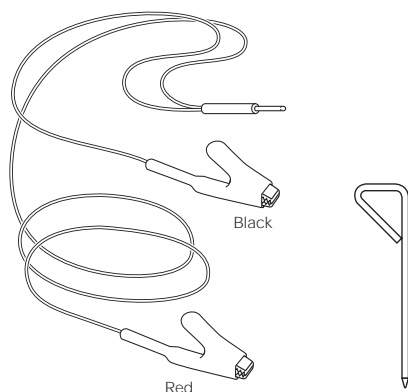
No tone indicates that all batteries require replacing.

Unscrew fastener and replace 4 x LR20 (D) cells. Observe correct battery polarity as indicated on instruction label.

### Loudspeaker

Emits a pulsing tone to indicate an induction output or satisfactory direct connection. Continuous tone indicates induction not available or bad connection.

*Note: Tone pulses continuously in Low Frequency mode.*



### Connection Cable

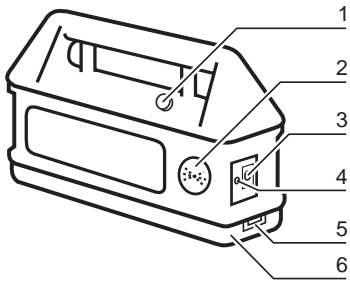
Red cable connects the Transmitter signal directly to target line. Black cable provides the ground return via Ground Stake.

### Ground Stake

Ground Stake is for making a ground connection to provide a return signal.

# RD400SL-2 User Guide

## RD400STx Transmitter



### On/Off (1)

Combined On/Off and Signal Strength Control.

For Signal Induction align the Transmitter handle with the target line.

### Loudspeaker (2)

Emits a continuous tone indicating satisfactory battery power. A lower pitch tone indicates successful direct connection to a target line.

The vane can be rotated to mute the loudspeaker tone.

### Connection Socket (3)

Accepts the Connection Cable or optional accessories such as Signal Clamp, Live Cable Connector or Live Plug Connector which, when connected, disables the induction mode.

### Ground Socket (4)

Accepts the green Ground Cable which provides a return path for a direct connection signal.

### Battery Tray Retainers (5)

Low battery state is indicated by a break in the transmitted signal and the loudspeaker tone every 5 seconds. When the batteries are exhausted, the Transmitter stops transmitting and the loudspeaker emits a short pulse every 5 seconds.

Push retainers down and pull out to release the battery tray from the Transmitter. If the retainers are stiff press down on the handle.

### Battery Tray (6)

Replace with 10 x LR6 (AA) alkaline batteries housed in reducer tubes or for longer battery life use 10 x LR20 (D) cell batteries without the reducer tubes.

Observe correct battery polarity as indicated on the battery tray.

A battery tray fitted with rechargeable D cells can be supplied as an option.

### Direct Connection Cable (7)

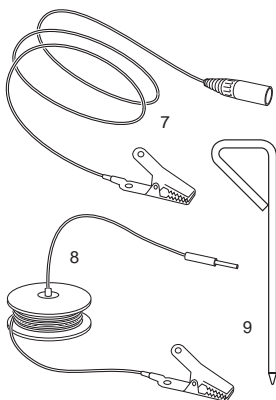
Connects the Transmitter Connection Socket signal directly to the target line.

### Ground Cable (8)

Connects the Ground Socket to the ground point/stake with 10 m (33 ft) of ground cable on a reel.

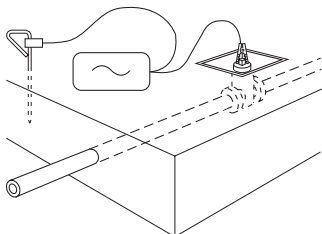
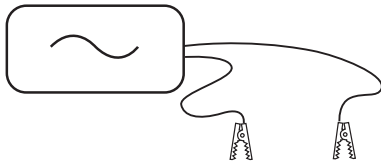
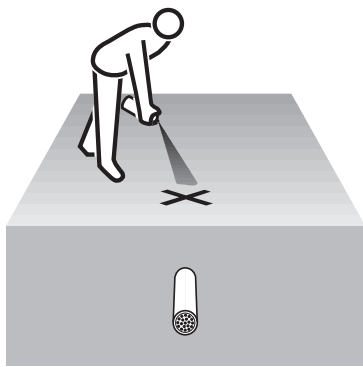
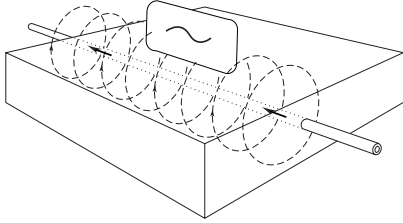
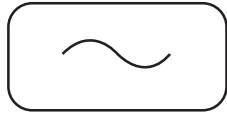
### Ground Stake (9)

Ground Stake is for making a ground connection to provide a return signal path.



# RD400SL-2 User Guide

## Transmitter Use



### Induction

The Transmitter has an internal aerial that will induce a signal onto a line (or lines) directly below it, without the need for access to the line.

Generally, induction can only be used to depths of 2 m (6 ft).

### Procedure

Switch on the Transmitter and place it directly above the target line (refer to the relevant Transmitter section for correct orientation).

Set Receiver sensitivity to mid-way and start locating line at least 10 paces away from the Transmitter.

Mark the ground where each peak response is detected by the Receiver.

*Note: Induction cannot be used to apply a signal to a line below reinforced concrete.*

The Transmitter signal may be detected directly and not from the target line.

To check, point the Receiver directly at the Transmitter. If the Receiver signal strength increases, either reduce the transmitter power or increase the distance from the Transmitter.

If the Receiver signal strength decreases, the received signal is from the buried line.

### Direct Connection

Suitable for use on continuous tracer wire, water and gas distribution systems, a telecom cable, and pipelines at a CP test or other access point.



**Warning**  
**Should only be used on a power cable sheath by qualified personnel.**

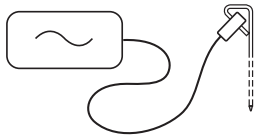
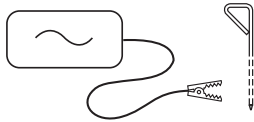
### Procedure

Plug the Connection Cable into the Transmitter and to the target line. If necessary clean off paint, rust or scale to ensure good connection.

Clip the ground cable to an independent grounding point a few paces away and preferably at right angles to the probable route of the target line. Do not attach ground to water pipe or buried line which could carry the signal.

# RD400SL-2 User Guide

## Transmitter Use



A good connection is indicated by a change in loudspeaker tone. If there is no tone change, check the electrical contact and ground. If necessary change the position of the ground or tip water over the ground contact if placed in dry soil or sand.

*Note: A Receiver can detect a signal many times weaker than that necessary for a Transmitter tone change and short distances can be traced without a tone change from the loudspeaker.*

### Signal Clamp

The Signal Clamp safely applies a signal to a pipe or a live cable without interrupting the supply. It applies a very discriminating signal with reduced coupling to other conductors.



#### **Warning**

**To avoid the risk of electric shock, the signal clamp must be connected to the transmitter before being placed around the pipe or cable.**

#### **Procedure**

Connect the Signal Clamp to the Transmitter.

Place the Signal Clamp around the pipe or cable, ensuring the jaws are closed. Switch on the Transmitter.

A disconnected pipe or cable cannot generally be located using a signal clamp.

*Note: Do not make a ground connection from the Transmitter when using the Signal Clamp.*

### Live Plug Connector

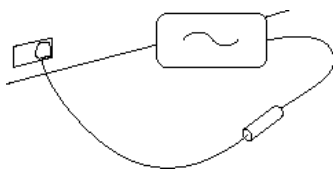
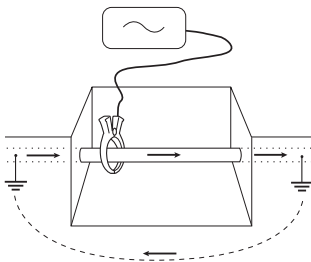
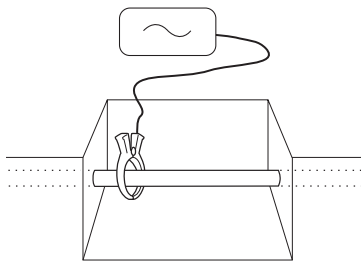
Applies the Transmitter signal to a live domestic power socket and via the domestic wiring system onto the service cable and the supply cable in the street. The signal should be detectable on the supply system to a few hundred paces each side of the point of application.

*Note: Do not connect the Transmitter to live cables without using a Plug Connector or Live Cable Connector.*

#### **Procedure**

Connect the Live Plug Connector to the Transmitter and to the live domestic power socket. Switch on the socket.

*Note: Live Plug Connector contains a protection unit to protect the user and the Transmitter from mains voltage up to 250V.*



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## Transmitter Use

### Trouble Shooting

When reporting any problem to your Radiodetection Dealer/Supplier it is important to quote the following:

Receiver Serial Number.

Software Revision Number.

Software Revision Number is displayed on the LCD during switch on.



### **Warning**

***Radiodetection Receivers detect almost all buried cables and most conductors, but there are some which do not radiate signals and which Radiodetection Receivers cannot detect. Radiodetection Receivers do not indicate whether a signal is from a single cable, several buried side by side or one above another.***

***This equipment is NOT approved for use in areas where hazardous gases may be present.***

***Reduce audio level before using headphones.***

***Ni-Cad batteries should be disposed of in accordance with your Company's work practice, and/or the relevant law or guidelines in your country.***



This instrument, or family of instruments, will not be permanently damaged by reasonable electrostatic discharge and has been tested in accordance with IEC 801-2. However, in extreme cases temporary malfunction may occur. If this happens, switch off, wait and switch on again. If the instrument still malfunctions, disconnect the batteries for a few seconds.

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